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Foreword

Iodine is an essential constituent of the thyroid hormones that are vital for optimal physical growth and for the normal development of the human brain during gestation and the first few years of life. From conception to at least 6 months of age, the iodine status of a breast-fed child is dependent on the iodine status of the child's mother. The consequences of iodine deficiency for foetal and infant development range from stillbirth, premature delivery, neonatal hypothyroidism and endemic cretinism to moderate or mild brain damage that impairs the intellectual and motor development of children. If not prevented, these changes are mostly irreversible.

The iodine in the human diet comes mainly from eating plants grown in soils that contain the mineral or from consuming herbivorous animals. The need for iodine from the diet may be difficult to meet in an environment in which the soil and water contain little iodine as a result of glaciation, erosion or leaching by heavy rainfall. As this happens in many parts of the world, it explains why the diets of people of both the industrialised and non-industrialised world are commonly deficient in iodine unless specific measures are taken to add iodine to food.

In 1990, the World Health Assembly urged all Member States to eliminate iodine deficiency disorders[1] and endorsed salt iodisation as the main strategy to reach this goal. To achieve this goal, the WHO set a target for more than 90% of households to use adequately iodised salt[2]. Data from recent surveys indicate that 67% of households worldwide are now consuming iodised table salt[3].

The effectiveness of salt iodisation as a mean to reduce iodine deficiency disorders is strongly related to commitment of governments, the enactment of legislation to add iodine to all salt used for human and animal consumption, and public health education to incite people to buy and use iodised salt. Although 67% of households may now be consuming iodised table salt, recent surveys of urinary iodine concentrations have indicated that the iodine intake is still insufficient in 54 countries, either because iodised table salt is not available or because it is poorly distributed[4] (WHO, 2004). Many other countries have pockets where iodised salt is not used. In these countries and areas, the groups most vulnerable to the effects of iodine deficiency are pregnant women and young children.

From the earliest stages of gestation, thyroid hormones produced by the mother pass across the placenta to stimulate cell division and differentiation in the foetal brain. Pregnancy is associated with a rapid increase in thyroid hormone production. This means that the mother's need for iodine increases during pregnancy because she is making additional thyroid hormones both for herself and for her foetus; because she is providing the future child with a store of iodine for the first months of life and because her daily losses of iodine in the urine are believed to be greater than normal. A mother's greater need for iodine continues during lactation because her breast milk should be the sole source of her infant's nutritional needs, including iodine, for the first 6 months of life[5].

The infant also needs a supply of iodine throughout the first few years of life; particularly after breast-feeding has stopped. This is another crucial period for brain development, and the supply of iodine has to be sustained throughout the period when complementary foods are given and until the child begins to eat the normal family diet.

Thus, there are three crucial periods to ensure an adequate iodine intake during early child development: pregnancy, especially during the first half; during the first 6 months of life; and throughout the period of complementary feeding. International concern for iodine nutrition during these critical periods of early life led the WHO to convene a Technical Consultation to examine the iodine status and iodine needs of three key groups: pregnant women, lactating women and children less than 2 years of age. The objectives of the meeting were: (1) to review the functional consequences of iodine deficiency for pregnant women and for child development, and review its public health significance; (2) to review the current requirements for iodine by pregnant and lactating women and children less than 2 years of age; (3) to review the current indicators for an adequate iodine nutrition status in these groups and (4) to review current strategies to eliminate iodine deficiency disorders in these groups.

The WHO commissioned five review papers on the following issues: (1) iodine requirements during pregnancy, lactation and the neonatal period, and indicators of optimal iodine nutrition; (2) the importance of iodine nutrition during pregnancy; (3) iodine deficiency and brain development; (4) the prevalence of iodine deficiency among women of reproductive age and (5) the impact of salt iodisation or iodine supplementation on iodine status during pregnancy, lactation and infancy. These papers were presented during the consultation and discussed in detail. After the presentations based on these papers, the meeting broke into two working groups to make recommendations to the WHO and its Member States on iodine requirements, on assessing iodine status and on measures to prevent and control iodine deficiency in the target groups. These papers, the summary of the discussion and the recommendations are presented in this issue of the *Journal of Public Health Nutrition*.

The main conclusion of this consultation is to increase iodine intake through supplementation to pregnant women and lactating women, and through breast-feeding and fortified complementary foods to infants and young

children, where a population's coverage with iodised salt is not sufficient to ensure an adequate iodine intake to these groups at risk. Iodine supplements come as a complement to iodised salt and not as an alternative.

It is hoped that the implementation of the recommendations of this consultation will contribute to reach the goal of elimination of iodine deficiency and therefore to the achievement of the Millennium Development Goals.

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